IN THE CLAIMS

Applicants have submitted a new complete claim set showing marked up claims with insertions indicated by underlining and deletions indicated by strikeouts and/or double bracketing.

The Patent Office has renumbered originally numbered claims 250-334 as current claims 249-333.

Please cancel claims 48, 74, 77-96, 112, 202-260, and 263-333 without prejudice or disclaimer.

Please amend pending claims 1, 2, 5-8, 32-47, 56-73, 75, 76, 97-101, 106-108, 110, 117-120, 175, 181, 183, 186, and 194, as noted below.

1. (Currently Amended) A device comprising a region having at least four semiconductors, each of the at least four semiconductors being free-standing and bulk doped semiconductor comprising at least one portion having a smallest width of less than 500 nanometers, wherein the at least four semiconductors have a variation in diameter of less than 20%.

2. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the device includes at least one semiconductor ~~comprises~~ comprising:

an interior core comprising a first semiconductor; and

one or more exterior shells exterior to the interior core, at least one of the exterior shells comprising a different material than the first semiconductor.

3. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an elemental semiconductor.

4. (Withdrawn) The semiconductor of claim 3, wherein the elemental semiconductor is selected from a group consisting of: Si, Ge, Sn, Se, Te, B, Diamond and P.

5. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the device includes at least one semiconductor ~~comprises~~ comprising a solid solution of elemental semiconductors.

6. (Currently Amended) The ~~semiconductor~~ device of claim 5, wherein the solid solution is selected from a group consisting of: B-C, B-P($BP6_6$), B-Si, Si-C, Si-Ge, Si-Sn and Ge-Sn.

7. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the device includes at least one semiconductor ~~comprises~~ comprising a Group IV-Group IV semiconductor.

8. (Currently Amended) The ~~semiconductor~~ device of claim 7, wherein the Group IV-Group IV semiconductor is SiC.

9. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a Group III-Group V semiconductor.

10. (Withdrawn) The semiconductor of claim 9, wherein the Group III-Group V semiconductor is selected from a group consisting of: BN/BP/BAs, AlN/AlP/AlAs/AlSb, GaN/GaP/GaAs/GaSb, InN/InP/InAs/InSb.

11. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an alloy comprising a combination of two or more Group III-Group V semiconductors from a group consisting of: BN/BP/BAs, AlN/AlP/AlAs/AlSb, GaN/GaP/GaAs/GaSb, InN/InP/InAs/InSb.

12. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a Group II-Group VI semiconductor.

13. (Withdrawn) The semiconductor of claim 12, wherein the semiconductor is selected from a group consisting of: ZnO/ZnS/ZnSe/ZnTe, CdS/CdSe/CdTe, HgS/HgSe/HgTe, BeS/BeSe/BeTe/MgS/MgSe.

14. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an alloy comprising a combination of two or more Group II-Group VI semiconductors from a

group consisting of: ZnO/ZnS/ZnSe/ZnTe, CdS/CdSe/CdTe, HgS/HgSe/HgTe, BeS/BeSe/BeTe/MgS/MgSe.

15. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an alloy comprising a combination of a Group II-Group VI semiconductors from a group consisting of: ZnO/ZnS/ZnSe/ZnTe, CdS/CdSe/CdTe, HgS/HgSe/HgTe, BeS/BeSe/BeTe/MgS/MgSe and a Group III-Group V semiconductors from a group consisting of: BN/BP/BAs, AlN/AlP/AlAs/AlSb, GaN/GaP/GaAs/GaSb, InN/InP/InAs/InSb.

16. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a Group IV-Group VI semiconductor.

17. (Withdrawn) The semiconductor of claim 16, wherein the semiconductor is selected from a group consisting of: GeS, GeSe, GeTe, SnS, SnSe, SnTe, PbO, PbS, PbSe, PbTe

18. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a Group I-Group VII semiconductor.

19. (Withdrawn) The semiconductor of claim 18, wherein the semiconductor is selected from a group consisting of: CuF, CuCl, CuBr, CuI, AgF, AgCl, AgBr, AgI.

20. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a semiconductor selected from a group consisting of: BeSiN2, CaCN2, ZnGeP2, CdSnAs2, ZnSnSb2, CuGeP3, CuSi2P3, (Cu, Ag)(Al, Ga, In, Tl, Fe)(S, Se, Te)2, Si3N4, Ge3N4, Al2O3, (Al, Ga, In)2(S, Se, Te)3 and Al2CO.

21. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a p-type dopant.

22. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an n-type dopant from.

23. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a p-type dopant from Group III of the periodic table.

24. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an n-type dopant from Group V of the periodic table.

25. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a p-type dopant selected from a group consisting of: B, Al and In.

26. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises an n-type dopant selected from a group consisting of: P, As and Sb.

27. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a p-type dopant from Group II of the periodic table.

28. (Withdrawn) The semiconductor of claim 27, wherein the p-type dopant is selected from a group consisting of: Mg, Zn, Cd and Hg.

29. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor comprises a p-type dopant from Group IV of the periodic table.

30. (Withdrawn) The semiconductor of claim 29, wherein the p-type dopant is selected from a group consisting of: C and Si.

31. (Withdrawn) The semiconductor of claim 27, wherein the n-type is selected from a group consisting of: Si, Ge, Sn, S, Se and Te.

32. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 200 nanometers.

33. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 150 nanometers.

34. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 100 nanometers.

35. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 80 nanometers.

36. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 70 nanometers.

37. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 60 nanometers.

38. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 40 nanometers.

39. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 20 nanometers.

40. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 10 nanometers.

41. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the smallest width is less than 5 nanometers.

42. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein ~~the~~ at least one of the at least four semiconductors is elongated, and the at least one portion of the at least one semiconductor is a longitudinal section.

43. (Currently Amended) The ~~semiconductor~~ device of claim 42, wherein the longitudinal section~~,~~ has a ratio of the length of the section to a longest width ~~is~~ greater than 4:1.

44. (Currently Amended) The ~~semiconductor~~ device of claim 42, wherein the longitudinal section~~,~~ has a ratio of the length of the section to a longest width ~~is~~ greater than 10:1.

45. (Currently Amended) The ~~semiconductor~~ device of claim 42, wherein the longitudinal section~~,~~ has a ratio of the length of the section to a longest width ~~is~~ greater than 100:1.

46. (Currently Amended) The ~~semiconductor~~ device of claim 42, wherein the longitudinal section~~,~~ has a ratio of the length of the section to a longest width ~~is~~ greater than 1000:1.

47. (Currently Amended) The ~~semiconductor~~ device of claim 1, wherein the device includes at least one semiconductor ~~comprises~~ comprising a single crystal.

48. (Cancelled)

49. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor is n-doped.

50. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor is p-doped.

51. (Withdrawn) The semiconductor of claim 1, wherein the semiconductor is magnetic.

52. (Withdrawn) The semiconductor of claim 51, wherein the semiconductor comprises a dopant making the semiconductor magnetic.

53. (Withdrawn) The semiconductor of claim 51, wherein the semiconductor is ferromagnetic.

54. (Withdrawn) The semiconductor of claim 53, wherein the semiconductor comprises a dopant that makes the semiconductor ferromagnetic.

55. (Withdrawn) The semiconductor of claim 54, wherein the semiconductor comprises manganese.

56. (Currently Amended) ~~An~~ A device comprising a region having at least four semiconductors, each of the at least four semiconductors being an elongated and bulk doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, wherein the at least four semiconductors have a variation in diameter of less than 20%.

57. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the device includes at least one semiconductor ~~comprises~~ comprising:

an interior core comprising a first semiconductor; and

one or more exterior shells exterior to the interior core, at least one of the exterior shells comprising a different material than the first semiconductor.

58. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein, at any point along the longitudinal axis of ~~the~~ at least one of the at least four semiconductors, a ratio of the length of the section to a longest width is greater than 4:1.

59. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein, at any point along the longitudinal axis of ~~the~~ at least one of the at least four semiconductors, a ratio of the length of the section to a longest width is greater than 10:1.

60. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein, at any point along the longitudinal axis of ~~the~~ at least one of the at least four semiconductors, a ratio of the length of the section to a longest width is greater than 100:1.

61. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein, at any point along the longitudinal axis of ~~the~~ at least one of the at least four semiconductors, a ratio of the length of the section to a longest width is greater than 1000:1.

62. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 200 nanometers.

63. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 150 nanometers.

64. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 100 nanometers.

65. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 80 nanometers.

66. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 70 nanometers.

67. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 60 nanometers.

68. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 40 nanometers.

69. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 20 nanometers.

70. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 10 nanometers.

71. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the point has a smallest width less than 5 nanometers.

72. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the device includes at least one semiconductor ~~comprises~~ comprising a single crystal.

73. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the device includes at least one semiconductor that is free-standing.

74. (Cancelled)

75. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the device includes at least one semiconductor that is n-doped.

76. (Currently Amended) The ~~semiconductor~~ device of claim 56, wherein the device includes at least one semiconductor that is p-doped.

77-96. (Cancelled)

97. (Currently Amended) A device comprising a region having at least four bulk doped semiconductors having a variation in diameter of less than 20%, each of the at least four semiconductors independently being ~~that is~~ at least one of the following: a single crystal, an elongated and bulk doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk doped

semiconductor with at least one portion having a smallest width of less than 500 nanometers, wherein a phenomena produced by a section of the bulk doped semiconductor exhibits a quantum confinement caused by a dimension of the section.

98. (Currently Amended) The ~~semiconductor~~ device of claim 97, wherein ~~the~~ at least one of the at least four semiconductors is elongated, and the dimension of the at least one semiconductor is a width at any point along a longitudinal section of the semiconductor.

99. (Currently Amended) The ~~semiconductor~~ device of claim 98, wherein the longitudinal section is capable of transporting electrical carriers without scattering.

100. (Currently Amended) The ~~semiconductor~~ device of claim 99, wherein the longitudinal section is capable of transporting electrical carriers such that the electrical carriers pass through the longitudinal section ballistically.

101. (Currently Amended) The ~~semiconductor~~ device of claim 99, wherein the longitudinal section is capable of transporting electrical carriers such that the electrical carriers pass through the longitudinal section coherently.

102. (Withdrawn) The semiconductor of claim 98, wherein the longitudinal section is capable of transporting electrical carriers such that the electrical carriers are spin-polarized.

103. (Withdrawn) The semiconductor of claim 102, wherein the longitudinal section is capable of transporting electrical carriers such that the spin-polarized electrical carriers pass through the longitudinal section without losing spin information.

104. (Withdrawn) The semiconductor of claim 98, wherein the longitudinal section is capable of emitting light in response to excitation, wherein a wavelength of the emitted light is related to the width.

105. (Withdrawn) The semiconductor of claim 99, wherein the wavelength of the emitted light is proportional to the width.

106. (Currently Amended) A device comprising a region having at least four bulk doped semiconductors that each exhibits coherent transport, wherein the at least four semiconductors have a variation in diameter of less than 20%.

107. (Currently Amended) A device comprising a region having at least four bulk-doped semiconductors that each exhibits ballistic transport, wherein the at least four semiconductors have a variation in diameter of less than 20%.

108. (Currently Amended) A device, comprising a region having at least four bulk-doped semiconductors that each exhibits Luttinger liquid behavior, wherein the at least four semiconductors have a variation in diameter of less than 20%.

109. (Withdrawn) A solution comprising one or more doped semiconductors, wherein at least one of the semiconductors is at least one of the following: a single crystal, an elongated and bulk-doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk-doped semiconductor with at least one portion having a smallest width of less than 500 nanometers.

110. (Currently Amended) A device comprising a region having at least ~~one~~ four doped semiconductors, the at least four doped semiconductors having a variation in diameter of less than 20%, wherein each of the at least ~~one~~ four doped semiconductors is independently at least one of the following: a single crystal, an elongated and bulk doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk doped semiconductor with at least one portion having a smallest width of less than 500 nanometers.

111. (Withdrawn) The device of claim 110, wherein the device comprises at least two doped semiconductors, wherein both of the at least two doped semiconductors is at least one of the following: a single crystal, an elongated and bulk-doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk-doped semiconductor with at least one portion having a smallest width of less than 500 nanometers, and wherein a first of the at least two doped semiconductors exhibits quantum confinement and a second of the at least two doped semiconductor manipulates the quantum confinement of the first.

112. (Cancelled)

113. (Withdrawn) The device of claim 111, wherein the at least two bulk-doped semiconductors are in physical contact with each other.

114. (Withdrawn) The device of claim 113, wherein a first of the at least two bulk-doped semiconductors is of a first conductivity type, and a second of the at least two bulk-doped semiconductors is of a second conductivity type.

115. (Withdrawn) The device of claim 114, wherein the first conductivity type is n-type, and the second type of conductivity type is p-type.

116. (Withdrawn) The device of claim 115, wherein the at least two bulk-doped semiconductors form a p-n junction.

117. (Currently Amended) The device of claim 110, wherein the device includes at least one semiconductor that is free-standing.

118. (Currently Amended) The device of claim 110, wherein the device includes at least one semiconductor that is elongated.

119. (Currently Amended) The device of claim 110, wherein the device includes at least one semiconductor ~~comprises~~ comprising a single crystal.

120. (Currently Amended) The device of claim 110, wherein the device includes at least one semiconductor ~~comprises~~ comprising:

an interior core comprising a first semiconductor; and

an exterior shell comprising a different material than the first semiconductor.

121. (Withdrawn) The device of claim 110, wherein the device comprises a switch.

122. (Withdrawn) The device of claim 110, wherein the device comprises a diode.

123. (Withdrawn) The device of claim 110, wherein the device comprises a Light-Emitting Diode.

124. (Withdrawn) The device of claim 110, wherein the device comprises a tunnel diode.

125. (Withdrawn) The device of claim 110, wherein the device comprises a Schottky diode.

126. (Withdrawn) The device of claim 125, wherein the transistor comprises a Bipolar Junction Transistor.

127. (Withdrawn) The device of claim 125, wherein the transistor comprises a Field Effect Transistor.

128. (Withdrawn) The device of claim 110, wherein the device comprises an inverter.

129. (Withdrawn) The device of claim 128, wherein the inverter is a complimentary inverter.

130. (Withdrawn) The device of claim 110, wherein the device comprises an optical sensor.

131. (Withdrawn) The device of claim 110, wherein the device comprises a sensor for an analyte.

132. (Withdrawn) The device of claim 110, wherein the analyte is a DNA.

133. (Withdrawn) The device of claim 110, wherein the device comprises a memory device.

134. (Withdrawn) The device of claim 133, wherein the memory device is a dynamic memory device.

135. (Withdrawn) The device of claim 133, wherein the memory device is a static memory device.

136. (Withdrawn) The device of claim 110, wherein the device comprises a laser.

137. (Withdrawn) The device of claim 110, wherein the device comprises a logic gate.

138. (Withdrawn) The device of claim 137, wherein the logic gate is an AND gate.

139. (Withdrawn) The device of claim 137, wherein the logic gate is a NAND gate.

140. (Withdrawn) The device of claim 137, wherein the logic gate is an EXCLUSIVE-AND gate.

141. (Withdrawn) The device of claim 137, wherein the logic gate is a OR gate.

142. (Withdrawn) The device of claim 137, wherein the logic gate is a NOR gate.

143. (Withdrawn) The device of claim 137, wherein the logic gate is an EXCLUSIVE-OR gate.

144. (Withdrawn) The device of claim 110, wherein the device comprises a latch.

145. (Withdrawn) The device of claim 110, wherein the device comprises a register.

146. (Withdrawn) The device of claim 110, wherein the device comprises clock circuitry.

147. (Withdrawn) The device of claim 110, wherein the device comprises a logic array.

148. (Withdrawn) The device of claim 110, wherein the device comprises a state machine.

149. (Withdrawn) The device of claim 110, wherein the device comprises a programmable circuit.

150. (Withdrawn) The device of claim 110, wherein the device comprises an amplifier.

151. (Withdrawn) The device of claim 110, wherein the device comprises a transformer.

152. (Withdrawn) The device of claim 110, wherein the device comprises a signal processor.

153. (Withdrawn) The device of claim 110, wherein the device comprises a digital circuit.

154. (Withdrawn) The device of claim 110, wherein the device comprises an analog circuit.

155. (Withdrawn) The device of claim 110, wherein the device comprises a light emission source.

156. (Withdrawn) The device of claim 155, wherein the light emission source emits light at a higher frequency than would the semiconductor if the semiconductor had a shortest width greater than the shortest width at any portion of the semiconductor.

157. (Withdrawn) The device of claim 110, wherein the device comprises a photoluminescent device.

158. (Withdrawn) The device of claim 110, wherein the device comprises an electroluminescent device.

159. (Withdrawn) The device of claim 110, wherein the device comprises a rectifier.

160. (Withdrawn) The device of claim 110, wherein the device comprises a photodiode.

161. (Withdrawn) The device of claim 110, wherein the device comprises a p-n solar cell.

162. (Withdrawn) The device of claim 110, wherein the device comprises a phototransistor.

163. (Withdrawn) The device of claim 110, wherein the device comprises a single-electron transistor.

164. (Withdrawn) The device of claim 110, wherein the device comprises a single photon emitter.

165. (Withdrawn) The device of claim 110, wherein the device comprises a single photon detector.

166. (Withdrawn) The device of claim 110, wherein the device comprises a spintronic device.

167. (Withdrawn) The device of claim 110, wherein the device comprises an ultra-sharp tip for atomic force microscope.

168. (Withdrawn) The device of claim 110, wherein the device comprises a scanning tunneling microscope.

169. (Withdrawn) The device of claim, wherein the device comprises a field emission device

170. (Withdrawn) The device of claim, wherein the device comprises a photoluminescence tag

171. (Withdrawn) The device of claim, wherein the device comprises a photovoltaic device

172. (Withdrawn) The device of claim, wherein the device comprises photonic band gap materials

173. (Withdrawn) The device of claim 110, wherein the device comprises a scanning near field optical microscope tips.

174. (Withdrawn) The device of claim 110, wherein the device comprises a circuit that has digital and analog components.

175. (Currently Amended) The device of claim 110, wherein the device comprises another semiconductor that is electrically coupled to ~~the~~ at least one ~~bulk doped~~ of the at least four doped semiconductors.

176. (Withdrawn) The device of claim 175, wherein the other semiconductor is a bulk-doped semiconductor comprising at least one portion having a smallest width of less than 500 nanometers.

177. (Withdrawn) The device of claim 110, wherein the device comprises another semiconductor that is optically coupled to the at least one bulk-doped semiconductor.

178. (Withdrawn) The device of claim 177, wherein the other semiconductor is a bulk-doped semiconductor comprising at least one portion having a smallest width of less than 500 nanometers.

179. (Withdrawn) The device of claim 110, wherein the device comprises another semiconductor that is magnetically coupled to the at least one bulk-doped semiconductor.

180. (Withdrawn) The device of claim 179, wherein the other semiconductor is a bulk-doped semiconductor comprising at least one portion having a smallest width of less than 500 nanometers.

181. (Currently Amended) The device of claim 110, wherein the device comprises another semiconductor that physically contacts ~~the~~ at least one ~~bulk-doped~~ of the at least four doped semiconductors.

182. (Withdrawn) The device of claim 179, wherein the other semiconductor is at least one of the following: a single crystal, an elongated and bulk-doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk-doped semiconductor with at least one portion having a smallest width of less than 500 nanometers.

183. (Currently Amended) The device of claim 110, wherein the device includes at least one semiconductor that is coupled to an electrical contact.

184. (Withdrawn) The device of claim 110, wherein the at least one semiconductor is coupled to an optical contact.

185. (Withdrawn) The device of claim 110, wherein the at least one semiconductor is coupled to a magnetic contact.

186. (Currently Amended) The device of claim 110, wherein a conductivity of ~~the~~ at least one of the at least four semiconductors is controllable in response to a signal.

187. (Original) The device of claim 186, wherein the conductivity of the at least one semiconductor is controllable to have any value within a range of values.

188. (Original) The device of claim 186, wherein the at least one semiconductor is switchable between two or more states.

189. (Original) The device of claim 188, wherein the at least one semiconductor is switchable between a conducting state and an insulating state by the signal.

190. (Withdrawn) The device of claim 188, wherein two or more states of the at least one semiconductor are maintainable without an applied signal.

191. (Original) The device of claim 186, wherein the conductivity of the at least one semiconductor is controllable in response to an electrical signal.

192. (Withdrawn) The device of claim 186, wherein the conductivity of the at least one semiconductor is controllable in response to an optical signal.

193. (Withdrawn) The device of claim 186, wherein the conductivity of the at least one semiconductor is controllable in response to a magnetic signal.

194. (Currently Amended) ~~A~~ The device of claim 186, wherein the conductivity of the at least one semiconductor is controllable in response to a signal of a gate terminal.

195. (Original) The device of claim 194, wherein the gate terminal is not in physical contact with the at least one semiconductor.

196. (Withdrawn) The device of claim 110, wherein at least two of the semiconductors form an array, and at least one of the semiconductors in the array is at least one of the following: a single crystal, an elongated and bulk-doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk-doped semiconductor with at least one portion having a smallest width of less than 500 nanometers.

197. (Withdrawn) The device of claim 196, wherein the array is an ordered array.

198. (Withdrawn) The device of claim 196, wherein said array is not an ordered array.

199. (Withdrawn) The device of claim 110, wherein the device comprises two or more separate and interconnected circuits, at least one of the circuits not comprising a doped semiconductor that is at least one of the following: a single crystal, an elongated and bulk-doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk-doped semiconductor with at least one portion having a smallest width of less than 500 nanometers.

200. (Withdrawn) The device of claim 110, wherein the device is embodied on a chip having one or more pinouts

201. (Withdrawn) The device of claim 200, wherein the chip comprises separate and interconnected circuits, at least one of the circuits not comprising a doped semiconductor that is at least one of the following: a single crystal, an elongated and bulk-doped semiconductor that, at any point along its longitudinal axis, has a largest cross-sectional dimension less than 500 nanometers, and a free-standing and bulk-doped semiconductor with at least one portion having a smallest width of less than 500 nanometers.

202-260. (Cancelled)

261. (Withdrawn) A semiconductor device, comprising

a silicon substrate having an array of metal contacts

a crossbar switch element formed in electrical communication with the array and having a first bar formed of a p-type semiconductor nanowire, and

a second bar formed of an n-type semiconductor nanowire and being spaced away from the first bar and being disposed transversely thereto.

262. (Withdrawn) A semi device of claim 261, wherein the second bar is spaces between 1-10 nm from the first bar.

263-333. (Cancelled)